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ELEMENTARY LOGIC

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DESIGNED FOR USE IN

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BY

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PREFACE.

IF there be any reason why this little book should be published, it consists in the following facts:

1. It places Logic on its true foundation, *i. e.*, the Primary Laws of Thought, and presents the elements of the science, together with the two processes of Reasoning by Induction and Deduction before the exemplification of the subject is attempted; and submits this as the order in which the subject should be treated.

2. It adapts the subject to the comprehension of the minds of students as well as to that of scholars, and thus makes it attractive to the learner.

With becoming deference we must say that we have found no work on Logic since Aristotle's, which lays down the foundation, the elements and processes of Reasoning and builds thereon, although they all, in some subsequent part of the book, teach that the Primary Laws of Thought constitute the foundation, and give the elements and processes as though they were secondary matters.

The plan here insisted upon is that these should come first and constitute the basis of the structure.

The question, whether any other work has pursued this plan or not, is hereby submitted, and, with its decision, the fate of this volume will be determined.

There is no occasion for criticism, nor controversy on the point submitted, for the works are now all before the public, and will show for themselves.

We acknowledge ourselves greatly indebted to many excellent works on Logic published on different plans for the matter contained in this, and especially to that admirable Elementary Treatise by Henry Coppee, known as "Coppee's Elements of Logic."

We lay no claim to originality, except in a solitary instance to be found in Chapter IV., on the subject of Imperfect Induction, and the general plan of treatment which is our own, and which we claim is peculiarly attractive to the youthful learner.

A. M. BURNEY.

September 1, 1884.

TABLE OF CONTENTS.

PART I—SIMPLE LOGIC.

CHAPTER I.—
Logic Defined and Analyzed.
Syllabus.
Practical Questions.

CHAPTER II.—
The Elements of Logic Explained.
Syllabus.
Practical Questions.

CHAPTER III.—
Logic as the Art of Reasoning.
Syllabus.
Practical Questions.

CHAPTER IV.—
Reasoning by Induction and Deduction.
Syllabus.
Practical Questions.

CHAPTER V.—
The Syllogism.
Syllabus.
Practical Questions.

CHAPTER VI.—
Figure and Mood of Syllogism.
Syllabus.
Practical Questions.

PART II—COMPLEX LOGIC.

CHAPTER VII.—

Complex Syllogism.
Syllabus.
Practical Questions.

CHAPTER VIII.—

Fallacies.
Syllabus.
Practical Questions.

CHAPTER IX.—

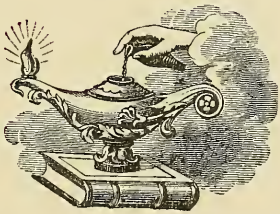
Peculiar Mode of the Syllogism.
Syllabus.
Practical Review.

CHAPTER X.—

The Socratic Method of Reasoning.

APPENDIX.

Practical Examples.
General Examples for Practice.
Parliamentary Rules.



LOGIC.

CHAPTER I.

THE SUBJECT DEFINED: ITS ANALYSIS AND SYNTHESIS.

1. The word Logic is derived from the Greek *Logos*, a *word* or *discourse* which has many shades of meaning, and hence the diversity of subjects to which Logic has been applied.

It is not our purpose to enter the fruitless controversy so long waged as to what Logic should or should not embrace, preferring rather to accept the definition generally given and confine it to the scope thus legitimately assigned to it by that definition.

2. Logic has generally been defined as the *Science of Reasoning*, or the *Art of Reasoning*, and inasmuch as we must know *how to reason* before we *can practice* it, and as the *Art* thus necessarily embraces the *Science*, we prefer to define it as *the Art of Reasoning*, and shall so use it in this treatise.

4. In the analysis of Logic which we propose in the subsequent pages, we shall see that the *Dictum* of *Aristotle* is the groundwork of the syllogism.

In like manner that same great philosopher has given us the principle of *contradiction* as the groundwork of all reasoning. This principle of *contradiction* is a *primary law of thought*, and is generally given in the classification as the *first law of thought*. The classification of these laws is as follows:

PRIMARY LAWS OF THOUGHT.

1. The Law of Contradiction.
2. The Law of Identity.
3. The Law of Excluded Middle.

These laws describe the very simplest truths, in which all people must agree, and embrace all notions which we can conceive. It is impossible to think correctly without them; hence, on them all reasoning must ultimately depend.

We merely refer to them here as the basis of reasoning and give the definition of each, reserving the full explanation and application of these laws till we come to exemplify Logic itself.

1. *The Law of Contradiction* means that, *Nothing can both be and not be.*

2. The Law of Identity means that, *Whatever is, is.*

3. The Law of Excluded Middle means that, *Everything must either be or not be.*

5. Having defined the subject and given the basis on which reasoning rests, we now propose to give

AN ANALYTICAL VIEW OF LOGIC.

1. Logic is the *Art of Reasoning.*

2. Reasoning expressed in language is called *an argument.*

3. The simplest and ultimate form of an argument is *the Syllogism.*

4. The Syllogism is composed of *three propositions*, called the *Major Premise*, *Minor Premise* and *the Conclusion.*

5. These three propositions, when legitimately connected in the form of the Syllogism, contain *three terms*, and only *three*, which are each used twice, and are called respectively, *the Major Term*, *the Minor Term*, and *the Middle Term.*

The first two must not be confounded with the Major and Minor Premises on account of similarity of name.

6. A *Term* is an act of *Apprehension*.

7. An Act of Apprehension is a pure conception by the mind of an object apprehended. The mind has three faculties of primary and original knowledge—consciousness, perception and intuition. By consciousness we gain a knowledge of the empire of mind itself; by perception we cognize the empire of matter; and by intuition we cognize those entities that are neither mind nor matter, such as space, duration of time, personal identity, cause and effect, infinity and substance.

When the mind through either of these primary faculties cognizes anything, as for instance, existence by consciousness, matter by perception, or space by intuition, the act of cognonition in each case is an act of apprehension.

Here we reach the elementary principle—apprehension. the lowest stage in the Analysis of Logic. Here the mind ceases to analyze, *to take parts*, and begins the opposite process of Synthesis, *to build up*.

When the mind apprehends an object, *i. e.*, *seizes it by* apprehension, it seeks a medium to express its act of apprehension. This medium it finds in words which in turn become *terms*, which in the form of expression become *propositions*, which, when legitimately connected, form the *Syllogism*, which is the ultimate form of an *argument*, and an argument expressed in *language* is *reasoning*.

We have thus indicated the process of Synthesis, and in order to make it still plainer, will submit the following:

SYNTHETICAL VIEW OF LOGIC.

1. *An Act of Apprehension gives us a Term.*
2. The three terms, technically called *the Major Term*, *the*

Minor Term, and *the Middle Term*, when properly arranged, give us the *three propositions* of the Syllogism.

3. The *three propositions*, technically called the *Major* and *Minor Premises* and the *Conclusion*, when legitimately connected, form the *Syllogism*.

4. The Syllogism based upon Aristotle's *Dictum* is the simplest form of *an argument*.

5. An argument is *reasoning expressed* in language.

6. Reasoning expressed in language is the *Dictum* of the *Primary Laws of Thought*.

7. The Art of Reasoning, based upon the Primary Laws of Thought, is Logic.

This completes the Synthesis and brings us back again to our subject, which is *Logic*. Analysis and Synthesis, the two processes of method in the study of Logic, are thus exhibited to acquaint the student with the *elements* of Logic, *their names* and *functions*. We will now give a topical review of this chapter, which we denominate a

SYLLABUS.

We have said that Logic is derived from the Greek *Logos*, which has many meanings, but is in this treatise defined to be the *Art of Reasoning*. That we are indebted to Aristotle for the *Law of Contradiction* as the groundwork of Reasoning as well the celebrated *Dictum* the groundwork of the Syllogism. That this *Law of Contradiction* is a *Primary Law of Thought* and generally considered as the first of the *three Primary Laws of Thought*, which are as follows:

1. Contradiction—*Nothing can both be and not be.*
2. Identity—*Whatever is, is.*
3. Excluded Middle—*Everything must either be or not be.*

These will hereafter be explained and applied as the groundwork of all Reasoning.

Then follows the analytical view of Logic, which shows it to be composed of *seven elements*, namely: The *Art of Reasoning*, the *Argument*, the *Syllogism*, the *Proposition*, the *Term*, the *Apprehension*, the *Conception*.

The mind ceases to analyze on the Act of Apprehension and changes to the opposite process of Synthesis, thus combining, 1, Apprehension into Term; and 2, Term into Proposition; and 3, Proposition into Syllogism; and 4, Syllogism into Argument; and 5, Argument into Reasoning; and 6, Reasoning into the Primary Laws of Thought; and 7, the Art of Reasoning into Logic, our subject.

PRACTICAL QUESTIONS.

1. How is Logic defined?
2. Why the Art, rather than the Science of Reasoning?
3. What is the groundwork of Reasoning?
4. Give the meaning of Contradiction.
5. Name and give the meaning of the other two laws of Thought.
6. What is a Primary Law of Thought?
7. Name the *seven* elements of Logic as shown in the Synthesis given.
8. Repeat these elements synthetically in order.
9. What is our exact subject?
10. What branches of learning must a student understand before he can pursue Logic successfully?

"THUS ENDETH THE FIRST CHAPTER."

CHAPTER II.

THE SEVEN ELEMENTS OF LOGIC EXPLAINED.

1. An Act of Apprehension, the ultimate element in our analysis of Logic, is a *pure conception* by the mind of an object apprehended, thus, "*to die for one's country is glorious.*" The words "*to die for one's country*" constitute the conception because they express exactly what the mind *conceives* to be "glorious." It takes all these words to express the conception in this proposition, and no more. Sometimes the conception is expressed by one single word, as *man is mortal.* The word *man* alone expresses the conception in this case, which is called a simple act of apprehension. Sometimes it is expressed by a number of words as "*to die for one's country*" as above, which is called a *Complex Act of Apprehension.* The Indian tribes of the West seem to understand how to express the *complex.* apprehension as indicated by their *Christian names*, such as "*Old-Man-Afraid-of-his-Horse*," "*Young Man-Afraid-of-his-Horse*," "*Spotted Tail*," etc.

When the Act of Apprehension is *simple* it gives us a *simple term*, and when it is complex it gives us a *complex term.* It is of the utmost importance that the Act of Apprehension should be a *true* as well as a *pure conception.* The greatest care should therefore be exercised in ascertaining in all cases *just what* the act of Apprehension *is*, and also exactly *what words* should be used to express it, for when expressed in language it becomes one of the *three terms* of the Syllogism. If the *Act of Apprehension* is in any way faulty it will *taint* the *whole argument.*

Let it be remembered that it is not the *words* but the *pure*

conception of what they express that makes the *Act of Apprehension*, and this Act of Apprehension makes the *Term*.

2. A *Term* in Logic is the Act of Apprehension *expressed in language*. There are *three* and *only* three terms in the Syllogism, and they are technically called the *Major*, the *Minor* and the Middle Terms.

EXAMPLE.

All *men* are *mortal*.
All *Americans* are *men*.
All *Americans* are *mortal*.

Here "*Mortal*" is the Major Term, because it includes the greatest number of persons. "*Americans*" is the Minor Term, because it includes the least number of persons. "*Men*" is the Middle Term, because it is the *medium* of comparison between the other two terms.

Each of these terms is used twice, and when properly arranged they give rise to the *three propositions* of the Syllogism, which we next notice.

3. A Proposition in Logic is the legitimate expression of the agreement or disagreement between *terms*, as *Cromwell was a hero; Brutus was not a patriot.* Here *agreement* is expressed between Cromwell and hero, the two terms, and this makes it a proposition. In like manner *disagreement* is expressed between Brutus and patriot, and this constitutes it a proposition.

The three propositions, technically the Major and Minor Premises, and the Conclusion, so arranged that the Middle Term is a *medium* of comparison between the *major* and *minor terms*, form the celebrated Syllogism of Aristotle, which we will next explain.

4. The Syllogism of Aristotle is the *Procrustean Bedstead* of all arguments, the ultimatum of all argumentation, the

elementary form and test, the court of last resort, to which all arguments and modes of reasoning must finally come.

The basis of the Syllogism is Aristotle's *Dictum*, which, literally translated, is this: *Whatever may be predicated of a whole class, may be predicated of each individual contained in the class.*

Upon this principle the *stagirite*, that ancient Dialectitian, constructed the celebrated Syllogism which has come down to us unimpaired through a period of more than two thousand years, and which, now as then, is composed of *three propositions*, and *three terms* which have been already explained.

EXAMPLE.

All men are mortal.
All Americans are men.
All Americans are mortal.

The *Major Term* "*Mortal*" is first compared with "*Men*" the Middle Term, then Americans the *Minor Term* is compared with "*Men*" the Middle Term, and finding that they agree both with the same *third term* they will agree with each other, hence we compare them directly with each other and declare their agreement, which forms the *Conclusion.*

5. An Argument consists of two parts, that to *be proven*, and that by *which it is to be proven.* That by which it is proven is embodied in the *premises;* and that to be proven is embodied in the *Conclusion.*

When these parts are stated in their natural order and simplest form they constitute the Syllogism. But when they are inverted, so that the Conclusion is stated first, it is called *the question*, and the premises are joined to it by the word *because as the reason.*

6. The basis of Reasoning is the Law of Contradiction

with its associate laws of Identity and Excluded Middle, the three forming the "Primary Laws of Thought."

Contradiction is thus explained: Nothing can have, at the same time and place, contradictory qualities, for instance a piece of paper can not be both white and black at the same time and place. It may be white at one time and black at another, and white in one part and black in another, but can not be both at the same time and place. All propositions implying contradictory qualities are impossible and false, and *so* because they violate this Law of Contradiction.

Identity teaches that everything *is itself*, and *not another*, that is identical with itself.

Excluded Middle teaches that there is no middle or third course in affirming *things* and *qualities*. When the question is asked as to these things and qualities the answer must be *yes* or *no*. If you are asked whether gold be white or not white, you must answer *yes* or *no*. You must affirm that it is white or that it is not white. You can not answer the question by saying that *it is yellow*, although that may be true. Yet it is an *excluded middle*.

7. Reasoning or Ratiocination is the simple act of the mind by which we *deduce* the *conclusion* from *known premises* which are before the mind, thus having before us the two known propositions as premises to-wit:

All men are mortal.
Washington was a man.

The mind *deduces* the conclusion that *Washington was mortal*, although it is not directly affirmed. This mental process is *Reasoning*.

It matters not to what subject it may be applied, it is Reasoning, for there is but *one universal principle* of Reasoning. We have no such thing as "*Mathematical Reasoning*"

and "*Moral* Reasoning," as distinct processes; but it is the one principle as above described, whether applied to Mathematics, Physics or Metaphysics. A mind well versed in Mathematics may reason well on that subject, but it must do so according to the one principle of Reasoning.

The reason is the same, whether we reason by the method of Induction or Deduction; and the Syllogism is equally applicable to both these methods, as will be shown hereafter.

SYLLABUS.

The student is advised to make himself thoroughly acquainted with these *seven elements* before proceeding further. Let him learn that an Act of Apprehension is the elementary principle—the ultimate element; that it is all important that this should be a true conception as well as a pure one; that this is determined by the primary laws of Thought; that the law of Contradiction declares that a thing *is* or *is not*—it can not *be* and *not be.* Identity proclaims that whatever *is*, *is;* that if a thing *is it is;* and Excluded Middle declares that there is *no middle course*, that a line is either straight or not straigt; it can not be *a third thing* between straight and crooked. It may be difficult at first to distinguish between the meanings of the Law of Contradiction and the Excluded Middle—the meaning of Contradiction is at once self-evident. The meaning of Excluded Middle is equally as evident, but not so readily perceived.

Let it be rememembered that an Act of Apprehension expressed in language is a *term;* that *terms* make *propositions* and *propositions* make the Syllogism, and the Syllogism is the *form* of every *argument*, and every argument is *reasoning* expressed in language, and the performance of all this is the *art* of *reasoning*, which is Logic—our subject.

PRACTICAL QUESTIONS.

1. Repeat by name the seven elements in order.
2. What is an act of Apprehension?
3. What is a Term? How many kinds?
4. What is a logical proposition?
5. Of what is the Syllogism composed?
6. Explain the three Primary Laws of Thought.
7. Explain Ratiocination.

CHAPTER III.

LOGIC AS THE ART OF REASONING.

1. We have already seen that we are indebted to Aristotle for the Law of Contradiction as the basis of Reasoning, as well, as the *Dictum*, the basis of the Syllogism. In like manner, we are also indebted to him for the very *ground work* of *all sciences*. That venerable stagirite and profound dialectitian about 350 years B. C. declared: "All science must set out from something already known; in a word, must have its first principles or grounds (ἀρχαι), which are not themselves *science*, but the result of *immediate cognition*" which he distinguishes from strict science, but calls it *certainty*. (See Anal., Part I., 1.; Eth. Nic. V., 3.) Dr. Thomas Reid, the great common-sense Philosopher, uses the very same expression (ἀρχαι) as the *first principles* of science. We may not wonder then, that Aristotle is *called* the *master mind* of *antiquity*, since he has given us the basis of the Syllogism, of the Reasoning, and of all sciences. Logic was denominated by Aristotle as dialectic, and was considered by Plato as the *regulator* of all *sciences*, the *all-comprehensive science* whose object is eternal truth, and is therefore possible and knowable only to God; yet, the *true ideal* at which the soul of man should ever aim in order to become *Godlike*.

2. We now propose to erect our *superstructure* on the threefold foundation given by Aristotle. For other foundations hath no man than that of the first principles of sciences, the Laws of Thought, especially that of Contradiction, and the *dictum* of the Syllogism, the great "instrument of all demonstration."

Before we can reason at all we must *know*; must know whereof we reason; must know that we ourselves exist, and that the external world exists; must know the ego and the non-ego.

3. Our Beneficent Creator has so constituted us that we know these *ground principles*, and we know them in such a way as to require no proof of them. They are *immediate* cognitions, mental axioms. This original knowledge is given as the capital stock for the acquisition of more knowledge; and it is not the property of a few philosophers, but is, as Dr. Reid says, the *common sense* and heritage of all the race.

Consciousness is the root of our knowledge. It is a witness to the mind of its operations. It testifies to the knowledge obtained by the mind through both the internal and external perception, so that we are conscious of the internal acts and states of our own minds, and conscious of the perception of the external world. This knowledge we cannot doubt. It is a *certainty*, a self-evident certainty. Here we begin.

4. We begin with the *known* and proceed to the *unknown*, the only method for the acquisition of knowledge.

The human mind, endowed with this original stock of knowledge, *knows that it knows*. It apprehends its own acts and states, and also external objects. This constitutes an Act of Apprehension, the simplest and ultimate element of Logic. The mind utters this Act of Apprehension in language, and then it becomes a *term*. The mind, having two such terms before it, proceeds by its own processes to declare that these *terms* agree or disagree. For instance, we have the two *terms line* and *straight*. The first Law of Thought, which is contradiction, declares that the *line* is *straight* or *not straight*. It cannot be both, it must be one and not the other. This declaration is a *proposition* either affirmative or negative, according as agreement or disagreement is declared.

5. With propositions thus obtained, and known to the mind to be true, it next proceeds, by one of its faculties called Comparison, to compare others known to be true, and deduce therefrom a third proposition, called the *conclusion*, which arises out of the known propositions as premises by comparing the two terms, heretofore not known to agree, with the same third term as a medium, with which both having agreed, are now axiomatically declared to agree with each other.

This completes the process of Reasoning, and brings us to a *conclusion* known to be *certain*. Thus starting on our original stock of knowledge, which is certain, we acquire other knowledge, and reduce it at the same time to certainty. We thus go on from one acquisition to another, adding to our *faith* knowledge, and to our knowledge certainty, throughout the vast domains of science.

It was in this manner, adding round after round of knowledge in spiral ascent up the "Hill of Science," that Aristotle, Descartes, Reid, and Hamilton reached the summit.

6. To know the process now described is to know Logic in its elements; to perform the process is to practice Logic. The former is the Science of Reasoning; the latter is the Art of Reasoning.

We now propose to illustrate the process by an example.

Let it be remembered that we must have some knowledge in order to obtain other. We know who John the Baptist was, and we know what a *priest is*. But we do not know *immediately* whether he was a priest or not. Hence we must seek this information through a *medium*. We know from the Bible that there were many priests, and that all the sons of priests were themselves priests. But the Bible is silent as to John the Baptist being a priest. Yet it tells us that he was the son of Zacharias the priest. Now let us take what we do

know, and try to find out what we do not know. We have two terms, Baptist and priest, and we do not know whether they agree or not.

We select another term, to-wit, "Son of a priest," and compare the other two with it, and if they both agree with it, then of a certainity they will agree with each other, for the axiom says so. We thus compare them:

The sons of priests were themselves priests. John the Baptist was a son of a priest. Therefore John the Baptist was a priest.

We now know *mediately* what we before did not know immediately, yet we know it as certainly as if we had known it immediately, because the *conclusion* partakes of the certainty of the premises.

7. Again, the Constitution of the United States provides for the election of the President, and eighteen of our citizens have been President, and enjoyed all the honors and emoluments of the office. But the Constitution has not declared a single one of them President by name or person; and if we deny this process of reasoning by *mediate inference*, we deny facts that are known and acknowledged to be true by the civilized world, to-wit, that each of these eighteen men has been President of the United States during certain periods of time in the Eighteenth and Nineteenth Centuries A.D. The Constitution has only declared that in the election "*the person having the greatest number of votes* shall be the President." It says nothing about George Washington, Thomas Jefferson, nor James K. Polk as President, yet each of these distinguished men has filled that position. Without *mediate inference* they could never have been known as Presidents. The process is simply this:

"*The person having the greatest number of votes*" is the medium of comparison, *i. e.*, the Middle Term. President

is the Major, James K. Polk is the Minor Term. The axiom says that things that agree with the same thing agree with each other. Now, if both the Major and Minor Terms agree with the Middle, we may unhesitatingly declare that James K. Polk was President of the United States. Let us try it.

The person having the greatest number of votes shall be President.

The President of the Senate declared that James K. Polk had the greatest number of votes in 1845. Therefore James K. Polk was President in 1845.

Deny this process, and there is no power on earth by which it can be made out that James K. Polk was ever entitled to the office (which he filled with so much credit to himself and profit to the country.)

We therefore lay this down, not as a convenient method of reasoning, or one by which men *may* reason, but as the principle by which they *must* reason, although in many cases they may not be aware of the fact and may not know the rules and principles by which they reason.

SYLLABUS.

We have presented this chapter in seven sections, and would advise the student to explain to himself the matter contained in each thus:

He should explain the three great principles for which we are indebted to Aristotle, and state what Dr. Reid has said of one of them; what Aristotle called Logic, and Plato's views of the subject.

Explain on what this treatise is founded, and why; also what is said of this original stock of knowledge, its certainty and use. State where all sciences must begin and how, and proceed. How the first element of Logic is obtained; and then elaborated into the Syllogism; and then give the axiom

on which this *mediate inference* is based. Explain how it was shown that John the Baptist was a priest, and that James K. Polk was once President, and give the Syllogism in each case.

PRACTICAL QUESTIONS.

Let the student explain each of the seven sections.

CHAPTER IV.

REASONING BY INDUCTION AND DEDUCTION.

1. Reasoning proceeds upon the Primary Laws of Thought as its basis by two methods—*Induction* and *Deduction*.

Induction is the method of Reasoning by which we discover laws from individual facts and causes from effects.

Deduction is the reverse method of deriving facts from laws and effects from causes.

To correspond with these two methods, Aristotle made two sorts of Syllogisms, the one *Inductive* and the other *Deductive*. The former sets out from *particulars* already known, and reaches general conclusions. The latter sets out from some general and admitted principle, and reasons to a particular conclusion. These are the only strictly scientific procedures, and we will now illustrate each by an example.

2. We submit as an example a Syllogism of Complete Induction, and reserve what is generally called Incomplete Induction for a more thorough consideration hereafter.

EXAMPLE OF INDUCTION.

Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune all revolve around the Sun in elliptical orbits.

These are all the planets.

Therefore all the planets revolve about the Sun in elliptical orbits.

The above is on the supposition that these are the only planets.

EXAMPLE OF DEDUCTION.

All the planets revolve about the Sun in elliptical orbits.

Jupiter is a planet.

Therefore Jupiter revolves about the Sun in an elliptical orbit.

These will serve to illustrate the two methods of Induction and Deduction.

3. We propose to treat Induction under the usual divisions of *Complete Induction* and *Incomplete Induction.*

We have already given an example of Complete Induction, and will only add that it owes its name to the fact that in this process a *complete* examination of all the individuals or facts may be made and declared.

Thus, Jesse had seven sons. One had been chosen king, and Samuel was sent to anoint him without knowing which it was. He caused six to pass before him for inspection and refused them all. If he had stopped at this his induction would not have been *complete.* But he *completed* it by sending out for David, the lad attending the sheep, and anointing him king.

The *Dictum* for this kind of Induction is this:

"*Whatever is true of all the constituent parts is true of the constituted whole.*"

4. Incomplete Induction is defined to be that process of induction which takes *a part* of the individuals or facts known to represent all the remaining ones, and for this reason it has been adjudged not certain in its conclusions.

The name and nature of this method of induction are calculated to impress the mind of the young with the idea that its results are uncertain, yet this is the very process from which the greatest part of all our knowledge is derived, and especially is this true in the sciences. It therefore presents the most interesting question connected with the whole subject of Induction. The question is this: On what principle are inductions deemed sufficient, short of complete enumeration of all the particulars?

We answer, "Our confidence in the uniformity of Natural

Laws is the principle." This confidence is embodied in the words which we denominate the Canon:

"Under the same circumstances and with the same substances the same effects always result from the same causes."

5. All experience teaches us that order, regularity, and uniformity prevail in the universe, in the "*cosmos*," which means *order;* and caprice, chance-work, and uncertainty are excluded. If it were otherwise the universe would crumble into chaos.

While it is conceivable that any one of the natural laws might be reversed—and it is certain that some of them have been miraculously suspended on great and important occasions—yet our reliance upon their permanence is simply unlimited. The thought that there will be no more daylight after to-day; that the water from the spring to day would destroy the life which it refreshed yesterday; that a stone would remain suspended mid-air instead of falling, never enters our minds except as an idle whim or an amusing fancy.

6. Let us examine a few examples of this so-called Incomplete Induction in the light of the canon already announced, and see if it answers fully the question propounded.

Let us first appeal to Mathematics. Euclid, in his 5th Proposition of Geometry, takes a single triangle and proves that its opposite angles are equal, and says not a word about any other triangle. But from this one experiment he proceeds to declare that any and all Isosceles triangles have their opposite angles equal, and the world cries Amen to the conclusion!

Again, if we take the first two odd numbers, 1 and 3, and add them, the sum will be 4, just *twice* the number of terms used. Then $1 + 3 + 5 = 9$, just three times the number of terms used. Then $1 + 3 + 5 + 7 = 16$, which is four times

the number of terms, and so on indefinitely. Now shall we go on *ad infinitum*, and examine all the combinations that might be made, or is not this sufficient to declare the conclusion, which is, that if we take any series of consecutive odd numbers, commencing with unity, and add them, the sum will be equal in every case to the number of terms multiplied by itself. Who can longer doubt this truth? Is not the Induction in both these cases sufficient? Do we not act on the conclusions as *certainties?* But let us get out of the domain of Mathematics, for some have peculiar notions about that science.

7. The chemist analyzes one pound of water and finds it composed by weight of eight parts of Oxygen and one of Hydrogen. He analyzes another pound with precisely the same result, and another, and so on with like results, till he has analyzed 100 pounds of water taken from various parts of the earth. Is he not now authorized to declare with *certainty* that *all water* is composed of eight parts of Oxygen and one of Hydrogen by weight?

Let us see if he is not so authorized. Let us examine this question in the light of the Primary Laws of Thought.

Suppose the chemist comes upon a substance, after a thousand trials, that seems not to conform to his former analysis. The Law of Contradiction, which is the first that takes hold of it, declares that the substance cannot be *water* and *not water*. It is either *water* or *not water*. It cannot be both at the same time.

The Law of Identity says whatever is *water* is *water*. The Law of Excluded Middle says the substance is *water* or *not water*, there is no third thing between these two—*water* and *not water*, no "*tertium quid.*" If then the substance in question *is water,* it is composed of eight parts Oxygen and one of Hydrogen, and conforms to the universal analysis. If it is *not* water, the chemist has made no declaration concerning it

whatever. Therefore his declaration that *water* is composed of eight parts Oxygen and one Hydrogen is a *certainty*.

8. A certain man had one hundred sheep, and one was "gone" astray. Now instead of leaving the ninety-nine, suppose he puts them into the hands of a skillful naturalist to have them classified, and receives the report that they are all *quadrupeds*, which is universally acknowledged to be true. Now what shall we conclude about the one that is *gone* astray? *Simply* and *truly* that it is also a quadruped. For Contradiction says *it is a sheep or not a sheep*. Identity says *if it is a sheep it is a sheep*. Excluded Middle says it is not a thing between *sheep* and *not sheep*. Then, if it is a sheep, it is a quadruped. If it is not a sheep, nothing has been affirmed concerning it. But it must either be a sheep or not a sheep. Therefore, in either case, it must be a quadruped or *nothing is asserted*.

Postulated, that it is a sheep, we affirm with certainty that it is a *quadruped*.

It being now settled that these one hundred are sheep and quadrupeds, shall we not with equal certainty affirm that *all sheep* are quadrupeds? Or must we examine each one before the Induction is sufficient? The only point to settle is, are they sheep? If they are, Identity says, all sheep are identical, and therefore quadrupeds.

9. Are there no cases in which doubt and uncertainty may arise from incomplete and unfinished Induction?

We answer that if doubt and uncertainty arise in any case, it is not from *incomplete induction*, but from *ambiguity* of language, and a *misunderstanding* of the principle of Identity, the plainest principle of thought.

To illustrate this point, let us consider a case in point, and from it "*judge all.*"

At one stage of Astronomical Science it was decided that

there were only *seven* planets in the solar system. Afterwards others were discovered, until the number of Major and Minor Planets now exceeds one hundred, and still others will likely be discovered. All that have been examined are found to move about the Sun in elliptical orbits. Now the question is, can we affirm with equal certainty that all planets hereafter to be discovered and examined will be found to *revolve* about the Sun in elliptical orbits? Our answer is that *we can*. For the Astronomical meaning of a planet is "*a celestial body which revolves about the Sun in an orbit of a moderate degree of eccentricity.*"—Webster.

Now, if other heavenly bodies should be hereafter discovered, *Contradiction* says they will either come under this definition or they will not. If they do, they are planets, and if planets, we can with equal certainty affirm that they revolve about the Sun in elliptical orbits. If they are not planets, then we can still affirm with certainty that *all planets* do so revolve.

The truth in every conceivable case depends, 1st, on a *just Classification;* 2d, on *just Definitions.* If the *classification* be *vague*, or the *definition inadequate*, uncertainty and error will be the result; yet, it will not be the fault of the *Induction*, but the fault of *mis-classification*, or *inadequate* definition after the work of induction is done.

As, for instance, astronomers in the future may discover new heavenly bodies, and classify some among planets which do not meet the conditions defined above. This would be an error of classification. We may catch fish and not string them; so we may perform induction and not classify *correctly*.

10. We therefore conclude that it is not necessary to *certainty* that the Induction should be complete, but rather that Incomplete Induction may give us equal certainty, provided it is performed with proper caution, and attended with *just*

classifications and *adequate definitions*, which are necessary steps in all philosophical investigations.

If it be said that these are necessary parts of Induction, we answer that they sustain the same relation to induction that *assorting* and *stringing* fish sustain to *catching* them.

Let it ever be remembered that Logic has nothing to do with the subject-matter of propositions; it deals with them as presented, and is not responsible for errors in classification and definition.

Let it be remembered that when a just classification has been made, and an adequate definition given, the great Canon of Induction declares "*under the same circumstances and with the same substances, the same effects always follow the same causes, and result from them.*"

Interferences and impediments to the operation of natural laws remove such instances from the Canon, and render them exceptional cases, for which there is *no rule.*

SYLLABUS.

This chapter is devoted mainly to the subject of Induction, which is divided into Complete and Incomplete Induction. The former is that whose enumeration includes all the facts and individual instances; the latter is that whose enumeration does not include all the instances. The conclusions of the former are considered certain, and it is here shown that those of the latter are not less so. The Syllogistic example of the planets is given to illustrate complete Induction, while two Mathematical, and two examples from Natural Sciences are given to illustrate Incomplete Induction. The student is ad-advised to turn to them and point them out as named, and explain their bearing fully. The question as to what principle guides us in the number of instances to be examined to secure certainty is answered by the general Canon, which the student

must master fully, as well as show how the Primary laws of thought are applied in this chapter.

PRACTICAL QUESTIONS.

1. Show how Induction and Deduction are opposite processes of the one principle of Reasoning.

2. Explain Complete Induction, and give the Syllogistic example, also the example of Deduction.

3. What is Incomplete Induction?

4. What question has been raised on it? How answered?

5. Give the Canon and apply it to each of the examples given to illustrate the certainty of such Induction.

6. Do doubt and uncertainty arise from Incomplete Induction?

7. From what do they arise?

8. Illustrate this from the science of Astronomy, using the planets as examples.

9. What two necessary steps mentioned?

10. State the conclusion of the whole matter.

CHAPTER V.

THE SYLLOGISM.

Having shown that the Syllogism is both inductive and deductive, and may be applied to both methods of Reasoning, with the remark that Induction is the *à posteriori* process, *i. e.*, the process of reasoning *from effects* to causes, and Deduction is the *à priori* process, *i. e.*, the process of reasoning from causes to effects, we will pass to the consideration of the Syllogism in its fullest sense. We have already explained its composition and application to all forms of argument.

Syllogism is the common name for *Mediate Inference*, and differs from Immediate Inference only in the employment of the Middle or third Term as the *Medium* of comparison between the other two terms. Thus, when we cannot compare two terms immediately with each other, we compare each with some third term, and note their agreement, or difference, as, if we wish to compare two rooms in size, we cannot place one in the other, but we may compare each with a measuring rule, and declare their relative dimensions. The measuring rule is the medium of comparison.

SPECIAL RULES OF THE SYLLOGISM.

1. Every Syllogism has three and only three terms—Major, Minor, and Middle.

2. Every Syllogism is composed of three and only three propositions—Major and Minor Premises, and the Conclusion.

3. The Middle Term must be distributed, *i. e.*, taken in its

whole comprehension at least once in one of the premises, and must not be ambiguous.

4. No term must be distributed in the conclusion which has not been distributed in one of the premises.

5. From negative premises no conclusion can be drawn.

6. If one premise be negative the conclusion must be negative.

7. From two particular premises no conclusion can be drawn.

8. If one premise be particular the conclusion must be particular.

These rules are essential to the Syllogism, and the student is advised to commit them to memory for ready use, as well as make himself thoroughly acquainted with what they teach.

We will now illustrate each rule by examples, mentioning them only by their number.

The first rule is violated when a Syllogism has more or less than three terms.

EXAMPLE.

A Bank is a financial institution.
The margin of a stream is a bank.
Therefore the margin of a stream is a financial institution.

Here we have four terms: 1, bank; 2, margin of a stream; 3, bank; 4, institution; and this makes it the error of *Ambiguous Middle*, there being no medium of comparison between the Major term, "Financial institution," and Minor, "Margin of a stream."

According to Rule 2d we must have three propositions. Since propositions are the legitimate expressions of terms, and we have three terms, of course we must have three propositions, thus:

All men are mortal.
Washington was a man.
Washington was mortal.

The first compares *men and mortal.* The second compares *Washington* and *man.* The third declares the agreement of *Washington,* the Minor term, with "*mortal,*" the Major term.

According to Rule 3d the following would be an error of *undistributed* Middle, thus:

All Frenchmen are Europeans.
All Germans are Europeans.

There is no *medium* of comparison, and hence no conclusion. The Rule also requires the terms to be *univocal, i. e.,* have the same meaning in both premises, and thus avoid the error of *ambiguous Middle.*

Rule 4th forbids us to distribute any term in the conclusion which has not been distributed in the premises.

This is evident from the Syllogism, whose sole object is to prove the conclusion by the premises, and not *independently* of them, thus:

Nations capable of self-government should not be oppressed.

Many nations are capable of self-government; therefore no nation should be oppressed.

The error here is that the *minor* term "many nations" is particular in the *minor* premise, and *is made universal* in the conclusion, *i. e.,* that is, distributed in the conclusion when it was not so distributed in the minor premise.

This is technically called "*illicit process*" of the *minor term.* It is more common in the major term, and more difficult to detect.

Thus for example:

All Anglo-Saxons love liberty.
The French are not Anglo-Saxons.
Therefore the French do not love liberty.

The "*major term*" "*love liberty*" is not distributed in the

major premise, for Anglo-Saxons are *only a part* of those who love liberty, and the major term should have embraced *all who love liberty*. This is called the fallacy of *illicit process* of the major term.

Rule 5th is founded on the principle that inference can only proceed from propositions that agree. Thus:

Americans are not Europeans.
Mexicans are not Europeans.

Here both terms disagree with the Middle Europeans, and no conclusion can be drawn; yet they may agree with each other, for there is a sense in which *Mexicans* are *Americans*, *i. e.*, inhabitants of the American continent. This is called the fallacy of *negative premises*.

Rule 6th depends on the axiom that two terms agreeing with the same third term agree with each other. For a negative proposition asserts disagreement, and the conclusion must be negative to carry out that disagreement.

Rules 7th and 8th are not self evident, but are only corollaries to the subjects of Illicit Process and Undistributed Middle, already explained in the 3d and 4th Rules.

SYLLABUS.

This chapter sets forth that the Syllogism is applicable alike to *induction* and *deduction*, to the *à posteriori* and the *à priori* processes of reasoning; that it is the common name for mediate inference, which differs from immediate inference only in the use of the middle term. Thus, having been told that Alexander was the son of Phillip of Macedon, we infer *immediately* that Phillip was father of Alexander. This is inferred without a *medium*. But we cannot infer *immediately* that Phillip was a great warrior, for he might have been a failure in war. But when we know that those who have conducted great military campaigns with success are

called great warriors, we only have to know that Phillip was of that number, and then we *infer mediately* that he was a great *warrior*.

After this follow the eight Rules of the Syllogism, six of which are self-evident, and the other two are corollaries. The student is advised to master these fully, and learn on what principles they are founded, for it is only in this way that we become acquainted with that most important form of argument, the Syllogism.

PRACTICAL QUESTIONS.

1. Explain the *à priori* and the *à posteriori* processes.
2. Explain *immediate* inference, also *mediate*.
3. Explain Rule the 3d.
4. Give the reason of Rule 4th.
5. Why no conclusion from negative premises.
6. Explain the reason of the 6th Rule.
7. Give a summary of the chapter.

CHAPTER VI.

FIGURE AND MODE OF THE SYLLOGISM.

1. Having presented the Syllogism, and the rules essential to it, we now propose to explain the Figure and Mode as applied to the Syllogism.

Logic recognizes *four kinds* of Propositions, which are designated by the *four letters*, A. E. I. O., to-wit:

1. The Universal Affirmative Proposition—A.
2. The Universal Negative Proposition—E.
3. The Particular Affirmative Proposition—I.
4. The Particular Negative Proposition—O.

EXAMPLES OF EACH.

All men are mortal is a universal affirmative proposition, because it affirms mortality of *all men.*

No men are trees is a universal negative proposition, because it denies the predicate to *all men.*

Some men are wise is a particular affirmative, because it affirms wisdom of a particular part of men only.

Some men are not wise is a particular negative proposition, because it denies wisdom to a *particular part* of men.

2. Figure in Logic is the technical name for the classification of syllogisms according to the *position* of the Middle Term.

As the Middle Term can have only four *positions* in the Syllogism, there can be only *four figures*, which are thus explained:

The first figure is always known by the Middle Term being the *subject* of the *major* premise, and predicate of the *minor.*

The second figure is always known by the Middle Term being *predicate* of *both premises.*

The third figure is always known by it being the *subject of both premises.*

The fourth figure is always known by it being the *predicate* of the *major* premise, and *subject* of the *minor*, which is the reverse of the first figure.

MODE OF SYLLOGISMS.

The Mood of a Syllogism is the manner in which the Syllogism is constructed out of the different kinds of logical propositions, which we have just shown to be four, designated by the letters A. E. I. O.

Now, if we have a Syllogism constructed out of three universal propositions, the symbols will be A. A. A., and we call it the Mood of Barbara, which is a meaningless word, and entirely arbitrary, but has been adopted by logicians from the fact that it combines the three A's necessary to denote three universal affirmative propositions. The word *Bavara* would have done as well as Barbara if it had been selected, since all the moods of the first figure are perfect, and do not need to be *reduced*, as those of the *second*, third, and *fourth* figure require to be.

We now submit a simple Syllogism to illustrate this mood of Barbara:

A. All men are mortal.
A. All Americans are men.
A. All Americans are mortal.

Here are three universal affirmative propositions, and as each is designated by A, the Syllogism is constructed in the mood of Barbara.

2. We have now defined *mood*, and given one mood and explained it, but the student now wishes to know how many moods he will have to deal with. We answer, that the num-

ber of moods depends, 1, upon the number of propositions in a Syllogism, which are three; 2, upon the number of categorial propositions which can enter into the Syllogism, which we have already said is four, to-wit, A. E. I. O. It therefore simply requires us to arrange these four letters, A. E. I. O., in three columns in *every possible combination* which will give us just sixty-four combinations, and hence sixty-four moods.

3. But as many of these combinations will violate the rules and axioms for the valid Syllogism already given, they are for this reason discarded.

Thus all combinations of affirmative premises having negative conclusions must be set aside because they violate the axiom. And all combinations of negative premises, with whatever conclusions, are useless. And all sets of particular premises, whatever be the conclusions, must be set aside.

Discarding all such invalid moods, we have only eleven valid ones left, and applying these to the four figures we would have $4 \times 11 = 44$ moods; but we find many of these which are valid in one figure are not valid in another, and for this reason we discard about twenty, and find five more useless, which leaves *only nineteen valid modes* in all, or four in the first figure, four in the second, six in the third, and five in the fourth.

We now give these moods in the four figures in the Latin verse as to sound and scansion, but with no intrinsic meaning in the words:

Figure I. *Barbara*, *Celarent*, *Darii*, *Ferio*.

Figure II. *Cesare*, *Camestres*, *Festino*, *Fakoro*.

Figure III. *Darápti*, *Disamis*, *Datisi*, *Felapton*, *Dokamo*, *Fériso*.

Figure IV. *Bramantip*, *Camenes*, *Dimaris*, *Fesapo*, *Fresison*.

The vowels in these words designate the moods, thus "Cesare" gives us E. A. E., which shows the mood to be

two universal negatives and one universal affirmative proposition.

Some of the consonants are very useful, also, in showing us how to reduce the imperfect moods of the *second*, third, and *fourth* figures to the perfect moods of the first figure, which will be explained under the head of Reduction.

EXAMPLES UNDER THE FIGURES AND MOODS.

FIGURE I.

Barbara.

A. Every *desire to gain by another's loss* is covetousness.
A. All gaming is *a desire to gain by another's loss.*
A. All gaming is covetousness.

Celarent.

E. No *one who is enslaved by his own appetites* is free.
A. Every sensualist *is enslaved by his appetites.*
E. No sensualist is free.

Darii.

A. All *pure patriots* deserve the rewards of their country.
I. Some warriors are *pure patriots.*
I. Some warriors deserve the rewards of their country.

Ferio.

E. *Nothing that impedes commerce* is beneficial to the revenue.
I. Some taxes impede commerce.
O. Some taxes are not beneficial to the revenue.

These are Aristotle's four original perfect moods, to which the others may be reduced.

FIGURE II.

Cesare.

E. No vicious conduct is *praiseworthy.*
A. All truly heroic conduct is *praiseworthy.*
E. No truly heroic conduct is vicious.

Camestres.

A. All true philosophers consider virtue a good in itself.
E. No advocate of pleasure considers it a good in itself.
E. No advocate of pleasure is a true philosopher.

Festino.

E. No righteous acts *will produce ultimate evil to the actor.*
I. Some kinds of association *will produce ultimate evil to the actor.*
O. Some kinds of association are not righteous acts.

Fakoro.

A. All true patriots are *friends to religion.*
O. Some great statesmen are not *friends to religion.*
O. Some great statesmen are not true patriots.

FIGURE III.

Darapti.

A. All *wits* are dreaded.
A. All *wits* are admired.
I. Some admired (persons) are dreaded.

Disamis.

I. Some *lawful things* are inexpedient.
A. All *lawful things* are what we have a right to do.
I. Some things which we have a right to do are inexpedient.

Datisi.

A. All *that wisdom dictates* is right.
I. Something *that wisdom dictates* is amusement.
I. Some amusement is right.

Felapton.

E. No *Science* is capable of perfection.
A. All *Science* is worthy of culture.
O. Something worthy of culture is not capable of perfection.

Dokamo.

O. Some *noble characters* are not philosophers.

A. All *noble characters* are worthy of admiration.

O. Some (persons) worthy of admiration are not philosophers.

Feriso.

E. No *false theories* exist in a perfect state.

I. Some *false theories* are harmless things.

O. Some harmless things do not exist in a perfect state.

FIGURE IV.

Bramantip,

A. All oaks are *trees.*

A. All *trees* are vegetables.

I. Some vegetables are oaks.

Camenes.

A. All miracles are *things of rare occurence.*

E. No *things of rare occurrence* make a slight impression on the mind.

E. No (things which) make a slight impression on the mind are miracles.

Dimaris.

I. Some taxes are *oppressive.*

A. *All that is oppresive* should be repealed.

I. Some things which should be repealed are taxes.

Fesapo.

E. No immoral acts are *proper amusemeats.*

A. All *proper amusements* are designed to give pleasure.

O. Some things designed to give pleasure are not immoral acts.

Fresison.

E. No acts of injustice are *proper means* of self-advancement.

I. Some *proper* means of self-advancement are unsuccessful.

O. Some unsuccessful efforts are not acts of injustice.

(*These Examples are copied from Coppee's Logic.*)

The conclusions of the *fourth* figure are indirectly stated, and rather accidentally stumbled into than employed intentionally, and hence this form of the argument is not often used.

The first figure is in exact accord with the *dictum* of Aristotle, and all its moods are perfect.

The second figure is used to disprove an argument or statement that has been made. Thus, suppose it had been affirmed that

All great men are true patriots.

We may refer this to *Fakoro*, of the second figure, for refutation, using great *men* instead of great *statesmen*.

The third figure is useful when we have singular terms which are *subjects* of propositions, and never *predicate:* and also when we wish to sustain an objection to our opponent's premises, which is *particular* when the case requires a *universal* proposition.

REDUCTION DIRECT AND INDIRECT.

It is said that any *imperfect* mood, that is, a mood in the second, third, or fourth figure, can be reduced to the *perfect* mood, which is the first figure; and the dictum immediately applied.

Reduction is of two kinds—*direct* and *indirect*.

The former proves in a perfect mood the same conclusion, or, being converted by inference, gives the same conclusion which was reached in the imperfect mood. The latter does not prove the same conclusion to be true, but its contradictory *false*, which establishes the same conclusion.

Let us take an example in Cesare, Figure II.:

E. No men are trees.
A. All oaks are trees.
E. No oaks are men.

By simple conversion:

No trees are men.
All oaks are trees.
No oaks are men.

This is indicated by the letter *s* in *Cesare*, which denotes *simple* conversion; and we simply convert the major premise, which makes it a Syllogism of the first figure and perfect mood.

This leads us to remark that certain letters in the mnemonic words used to designate the moods indicate the process of reduction, and when we see these letters they are a sign to us of what process we should employ to convert that mood. The letter *s* denotes *simple conversion* of the major premise, as already shown; the letter *k* shows that the major premise is to be converted by *negation*. Thus, All good men are virtuous, is converted by negation when we say, *All not virtuous are not good men*; the letter *m* denotes the transposition of the premises, *i. e.*, placing the last first; the letter *p* denotes conversion by limitation, *i. e.*, instead of saying, *All men are animals*, limit by saying, *Some men are animals.*

Instead of going through all the imperfect moods, we append a tabular view of reduction, usually given to direct pupils in the performance of the work.

TABLE OF REDUCTION.

	MOOD TO BE REDUCED.	WILL REDUCE TO.	PROCESS OF REDUCTION.
Fig. II.	Cesare	Celarent	(s) Convert major premise simply.
	Camestres	Celarent	(m) Transpose the premises. (s & s) Convert the minor premise and conclusion simply.
	Festino	Ferio	(s) Convert the major premise simply.
	Fakoro	Ferio	(k) Convert the major premise by negation.
	Darapti	Darii	(p) Convert the minor premise by limitation.
Fig. III	Disamis	Darii	(m) Transpose the premises. (s & s) Convert the minor premise and conclusion simply.
	Datisi	Da i	(s) Convert the minor premise simply.
	Felapton	Ferio	(p) Convert the minor premise by limitation.
	Dokamo	Darii	(k) Convert the major premise by negation. (m) Transpose the premises.
	Feriso	Ferio	(s) Convert the minor premise simply.
Fig. IV.	Bramantip	Barbara	(m) Transpose the premises. (p) Convert the conclusion by limitation.
	Camenes	Celarent	(m) Transpose the premises. (s) Convert the conclusion simply.
	Dimaris	Darii	(m) Transpose the premises. (s) Convert the conclusion simply.
	Fesapo	Ferio	(s) Convert the major premise simply. (p) Convert the minor premise by limitation.
	Fresison	Ferio	(s & s) Convert the major and minor premises simply.

INDIRECT REDUCTION.

Regarding the subject of indirect reduction, more curious than practical among students, we will give the rules usually used in its performance, and direct the student who wishes to learn it to take the rule in connection with the tabular state-

ment given for direct reduction, and he can work it out for himself.

RULES FOR INDIRECT REDUCTION.

I. Take the contradictory of the conclusion in the second figure and proceed with it as you would *Fakoro*.

II. Take the contradictory of the conclusion for the major premise in the third figure and proceed as you would with *Darapti* of that figure.

III. Take the contradictory of the conclusion for the minor premise in the fourth figure and proceed as you would with *Bramantip* in the table.

SYLLABUS.

This chapter sets out to teach us Figure and Mood. Figure is a technical name in Logic which is employed to designate the classification of the Syllogism according to the position of the *middle term*.

When the middle term is *subject* of the major premise, and predicate of the minor, the Syllogism is in the *first figure*.

When it is predicate of *both* premises the Syllogism is in the *second figure*.

When it is *subject* of both premises the Syllogism is in the *third figure*.

When the middle term is the *predicate* of the major and *subject* of the minor the Syllogism is in the *fourth figure*. Reverse the first figure and it gives the fourth. Reverse the second and it gives the third, and *vice versa*.

Mood is the *manner* of constructing the Syllogism out of the four logical propositions. If we so construct the Syllogism that the major premise be a universal proposition and negative, the minor be universal and affirmative, and the conclusion be a universal negative, it will be in the *mood* E. A. E., which we arbitrarily call *Celarent*.

The possible combinations of the three propositions of the Syllogism, and the four categorical logical propositions, are sixty-four in number, but many of these, for reasons given in this chapter, are thrown aside as useless and invalid, which leaves us only nineteen valid moods, as heretofore explained.

Now we request the student to make himself familiar with all the figures and moods and their distinctions.

PRACTICAL QUESTIONS.

1. What is Figure in Logic?
2. State the position of the middle term in each.
3. What is mode in Logic?
4. State the number of possible combinations of logical propositions in moods.
5. State the number of valid moods.
6. Give the premises for this conclusion:

"All oaks are trees."

7. Give the Syllogism for this:

All is not gold that glitters.

8. Give the Syllogism for this:

Jesus Wept.

9. Make a Syllogism of this:

No man can perform a miracle.

10. Classify this:

One hat costs four dollars.
Four hats cost four times four dollars.
Therefore four hats cost sixteen dollars.

COMPLEX SYLLOGISMS.

CHAPTER VII.

I. THE ENTHYMEME.

This word is derived from two Greek words combined into one, and means to *conceive in the mind.* Hence it is the name of a Syllogism, with one premise suppressed, that is conceived in the mind and not expressed. Thus:

Cæsar is a man,
Therefore Cæsar is mortal,

is an enthymeme with the *major* premise conceived in the mind and not expressed. Or we may suppress the *minor* premise and it will read thus:

All men are mortal.
Therefore Cæsar is mortal.

The major premise is the one usually suppressed, as it is the one to which assent is readily given.

II. THE SORITES, OR CHAIN ARGUMENT.

Sorites is from the Greek, and means a collection. Hence, it is an abridged argument, consisting of a series of propositions, in which the predicate of the first is the subject of the second, and so on until we combine the subject of the first and predicate of the last to form a conclusion. Thus:

The mind is a thinking substance.
A thinking substance is a spirit.
A spirit has no composition of parts.
That which has no composition of parts is indissoluble.
That which is indissoluble is immortal.
Therefore the mind is immortal.

This may be expressed in four simple Syllogisms, as,

A thinking substance is a spirit,
The mind is a thinking substance,
The mind is a spirit,

and so on.

This is a simple and powerful form of an argument, in which the mind, starting with the only minor term *mind*, links it with each middle term by jumping from one to another till it reaches the appointed conclusion.

If we desire to establish the effect of a republican government we may say:

The Americans make their own laws.
Those who make their own laws are free.
Those who are free are contented.
Those who are contented are happy.
Therefore the Americans are happy.

HYPOTHETICAL SORITES.

A collection of conditional propositions so arranged that the consequent of each becomes the antecedent of the next, forms a hypothetical Sorites, and the conclusion comes from either affirming the *first* antecedent with the *last* consequent, or by denying the last consequent with the *first* antecedent. Thus:

If the Bible is from God it should be taught.
If it should be taught men must teach it.
If men must teach it they should be supported.
But the Bible is from God, therefore its teachers should be supported.

THE EPICHIREMA.

This word is from two Greek words which, taken together, mean *seizing with the hands*, and it is the name of a very powerful form of argument, and one that was a favorite weapon with the disputatious Greeks.

The Epichirema requires each premise to be established separately before the conclusion is drawn, *i. e.*, it lays violent *hands on* the proof first. Thus:

The victors are injured by war; because it hardens their hearts:
The French were victors at Marengo, for they retained the field;
Therefore the French were injured by their victory.

All true patriots are friends to religion, because it is the basis of national prosperity;
Some great statesmen are not friends to religion because they reject its teachings;
Therefore some great statesmen are not true patriots.

HYPOTHETICAL SYLLOGISMS.

This is a Syllogism formed out of hypothetical propositions.

There are two and only two kinds, the *constructive* and *destructive* Syllogisms.

In the *constructive* form we use the whole conditional proposition as the *major premise;* we affirm the antecedent for the *minor premise*, which gives us the affirmation of the consequent for the conclusion. Thus:

If he has a fever, he is sick.
He has a fever,
Therefore he is sick.

The destructive is the negative form. Thus:

If he has a fever, he is sick.
He is not sick,
Therefore he has not a fever.

CONDITIONAL SYLLOGISMS.

These contain a condition in the major premise. Thus:

1. If the fourth commandment is binding upon us we must observe the Sabbath;
   But the fourth commandment is binding upon us,
   Therefore we must keep the Sabbath holy.

2. If taste is uniform all men will admire the same objects;
   But all men do not admire the same objects,
   (*One sees beauty where another sees deformity.*)
   Therefore taste is not uniform.

DISJUNCTIVE SYLLOGISM.

A disjunctive Syllogism is one whose major premise is a *disjunctive* proposition, and minor a *categorical*.

EXAMPLE.

Brutus was either a parricide or patriot.
He was not a parricide,
Therefore he was a patriot.

THE DILEMMA.

This is a compound argument composed of conditional propositions, upon which we reason disjunctively.

If there be two conditional Syllogisms joined with a minor premise that is disjunctive, it is called a dilemma; if three, it is called trilemma, etc. But we use dilemma in a generic sense to designate all these forms.

EXAMPLES.

If Æschines joined in the public rejoicings, he was inconsistent.
If he did not, he was unpatriotic.
But he either did, or did not join.
Therefore he was either inconsistent or unpatriotic.

The dilemma is the jaw-bone with which Pyrrho, the giant sceptic, was slain. He put forth the sweeping proposition that

"Nothing is true." "Everything is false and contradictory." Here is the celebrated weapon that slew Scepticism and redeemed Philosophy. It was addressed to Pyrrho thus:

If what you say is true, then there is something which is not false, *and your doctrine is wrong.*
If what you say is false, then it has no value as an argument, *and again your doctrine is wrong.*
But what you say must be either true or false.
Therefore in either case your system is wrong.

If you can prevent the birds from flying over your head, you should do so, and not fret about it.
If you cannot prevent them, it is useless to fret about it.
But you either can or cannot prevent them.
Therefore it is *useless* to fret about the birds flying over your head.

SYLLABUS.

The object of this chapter is to explain and exemplify the various kinds of *Complex Syllogisms.*

We will now review them in the order in which they have been presented.

1. The Enthymeme denotes that a part of the Syllogism is conceived in the mind, and hence omitted in the expression. It is always one or the other premise that is suppressed, and generally the *major.*

2. The Sorites, or chain argument, is a *collection* of simple Syllogisms, so arranged as that the predicate of the first becomes the subject of the second, and so on, until we can combine the subject of the first with the predicate of the last for a conclusion.

This is a convenient form of an argument in support of great truths, such as the immortality of the mind.

3. The Hypothetical Sorites is composed of conditional propositions so arranged as that the consequent of each becomes the antecedent of the next, and so on till the conclu-

sion is reached by either affirming the first antecedent with the last consequent, or the last consequent with the first antecedent.

4. Please notice the etymology of the Epichirema, and it will go far toward fixing its potency as an argument upon your mind. The idea is that it lays *hands* on the proof as it walks in triumph to the conclusion.

5. We next have the Hypothetical Syllogism, which is formed out of hypothetical propositions, either constructively or destructively. Look over the explanation and example given in the treatment of it, and you will understand it.

6. The Conditional Syllogism is formed out of conditional propositions in such a way that the affirmation of the consequent will follow the affirmation of the antecedent.

7. Passing over the Disjunctive Syllogism, which may be learned by reference to that head, we remark that the Dilemma is one of the most powerful forms of the Complex Syllogisms. It is compound, and combines two conditional Syllogisms, with a disjunctive minor premise. Examine carefully the examples given, and see if they correspond with the explanation of the dilemma.

PRACTICAL QUESTIONS.

1. Explain the Enthymeme and the example given.
2. Explain the Sorites and its example.
3. Explain the Hypothetical Sorites and repeat the example.
4. Explain the Epichirema and show its use by the example.
5. Explain the Hypothetical Syllogism and give the example.
6. Explain the Conditional Syllogism and give the example.
7. Explain the Dilemma, Trilemma, etc., and give the two examples, and explain them fully as to construction.

CHAPTER VIII.

FALLACIES.

A Fallacy is an *invalid argument*, which has the appearance of being valid, and when used *to deceive*, it is called a *sophism*.

Fallacies are first divided into *formal*, *i. e.*, fallacies *in dictione*, and fallacies in the subject-matter, *i. e.*, *extra dictionem*. The former is a logical fallacy, and the latter is a non-logical fallacy. But in order to show the difference between them, so that they may not be confounded, each will now be explained.

FORMAL FALLACIES.

These are logical fallacies, and therefore violate the dictum of Aristotle, as well as the axioms and rules for determining the validity of an argument.

There are five fallacies of this kind, which are the following:

1. Undistributed middle terms.
2. Illicit process of either term.
3. Negative premises.
4. Affirmative conclusion from negative premises, and *vice versa*.
5. More than three terms in an argument.

As a matter of caution we will state that these fallacies are not usually stated in the syllogistic form, but rather shun that as the light that exposes them, and seek the enthymeme and other abridged forms under which to conceal their deformity. Whenever the student has a doubt as to the validity of an argument, he should at once write it out in the syllogistic form, using the symbols, which of themselves will go far to-

ward detecting the fallacy, and utterly prevent the *fifth* form, as there are only *three* symbols to be used.

EXAMPLE OF UNDISTRIBUTED MIDDLE.

All good fathers provide for the physical wants of their children.
Eli of old thus provided for his children.
Therefore Eli of old was a good father.

Or by symbols thus:

All X is Y,
All Z is Y,
All Z is X.

Y is the middle term, and is *undistributed*, being the predicate of both the affirmative premises. In other words, it is not a *medium* of comparison between X and Z, and the fallacy is in making Z agree with X when no comparison has been instituted between them.

EXAMPLE OF ILLICIT PROCESS.

All responsible beings are accountable.
Brutes are not responsible beings.
Therefore brutes are not accountable.

By symbols thus:

All X is Y.
No Z is X.
No Z is Y.

Here Y is distributed in the conclusion, but not distributed in the *major* premise, therefore it is called *illicit process of the major term.*

The deceptive character of this fallacy is, that while probably no one will deny the conclusion, yet it does not arise from the premises. It is for this reason called *illicit*, or *unlawful process*, because it professes to come from the premises when it does not.

Those who use these fallacies through design, generally combine many single forms into one compound argument so as to cover up the weakness of each form. In such cases the

student should examine each proposition, and subject it to the tests of the dictum, and axioms and rules already laid down.

INFORMAL FALLACIES.

According to the principle of contradiction, every conclusion either does or does not follow from the premises. If it does not follow, then it is a formal fallacy under one of the classes mentioned. If the conclusion does follow from the premises, and yet when written out by the symbols the fallacy does not appear, you may know the fault is not in the *reasoning*, but in the *subject matter* of the propositions, with which Logic has nothing to do; hence it is called an informal fallacy. When propositions are presented for ratiocination, Logic takes it for granted that they are *true* as *propositions*, and only assumes to show correct conclusions from the propositions as given.

If we have the general symbolic proposition that X is Y, and you choose to attach to X the meaning *learning*, and to Y the meaning *preposterous*, Logic will show you the correct conclusion, which is from the *data*, *Learning* is *preposterous*. If you object to this, Logic says, It is not my fault; I only show you the *conclusion* from your premises.

Informal fallacies may all be classed under two heads, viz:

1. Error of the premise.
2. Error of the conclusion.

Under the first division we have the *petitio principii*, which is called in English *begging the question: arguing in a circle; non causa pro causa*, which assigns a false, or undue cause. These, all being errors in the premise, are somewhat similar.

The *petitio principii* uses a premise to support an adopted conclusion, as if one should say: "Morphia produces sleep because it is an anodyne," which is simply saying, Morphia produces sleep *because it produces sleep*.

As an example of *arguing in a circle* we may give this: A man undertakes to prove the existence of God by the Bible, and then establishes the inspiration of the Bible from the fact that it came from God.

EXAMPLE.

Whatever the Bible says is true.
It says there is a God.
Therefore it is true that there is a God.
The word of God is true.
The Bible is the word of God.
Therefore it is true.

Here the existence of God is sought to be proven by the Bible, and then the truth of the Bible is to be proven by God's veracity. The conclusions are true, but do not arise from the argument given.

The *non causa pro causa* is illustrated by the many prevalent forms of superstition that might be mentioned, as for instance, assigning an eclipse of the sun or moon as the cause of war or famine.

ERRORS IN THE CONCLUSION.

These are all included under the technical name of *Ignoratio elenchi*, which means an irrelevant conclusion.

EXAMPLE.

All who found universities are patrons of learning;
Alfred the Great founded the University of Oxford;
Therefore *he was* a scholar.

The conclusion is *irrelevant:* it should be, *he was a patron of learning.*

Under this head may be classed the following informal fallacies:

Argumentum ad hominem, which is an unfair appeal to one's vanity or prejudice. It is used when one has no argument by

simply appealing to his adversary, and saying, "*Well*, you don't believe it anyway."

In like manner the *argumentum ad populum* is used to whole assemblies and peoples. It is the logic of the demagogue to inflame passion and excite prejudice.

The *argumentum ad verecundiam* relates to the modesty of an individual which should prevent him from opposing the opinions of the "fathers."

These last three forms are not necessarily fallacies, but are most likely to be so used. They may often be used correctly and forcibly, as when Nathan said to David, "Thou art the man."

VERBAL FALLACIES.

These are fallacies growing out of *words* which are used ambiguously, and generally in the middle term, as:

A pagan is a disbeliever in Christ;
Every villager is a pagan;
Therefore every villager is a disbeliever in Christ.

The word *nothing* may be made to yield a fruitful crop of these fallacies, as:

Nothing is whiter than snow,
And nothing is blacker than a crow.
Nothing is a jug-full of emptiness, etc.

Nothing is better than health.
A shilling is better than nothing.
Therefore a shilling is better than health.

No cat has two tails.
Pussy has one more tail than no cat.
Therefore Pussy has *three tails*.

POPULAR FALLACIES.

These are such as a nation, an age, or a race will unite on, and refuse to be divorced therefrom. For instance, a Russian

claims that absolute monarchy is the best form of government, while the English believe in a limited monarchy.

Nil de mortuis nisi bonum may be a popular fallacy, but is not necessarily so. In like manner *De gustibus non est disputandum* may be so used.

Among these may be classed the fallacy of *sweeping classification*. It consists in ascribing to one person what belongs to another, simply because they are both of the same class. Examples of this may be seen in the persecution of one king because another may be cruel.

The "*No precedent argument*" is another form of popular fallacies. It is used thus: That measure will not do because it is entirely new and unheard of; there is no *precedent* for it.

These popular fallacies are only mentioned here to put the student on his guard as to their use, for they may often be used as correct forms of arguments.

SYLLABUS.

This chapter treats of fallacies which are defined to be *invalid* arguments in the form of valid ones. When they are used to deceive they are called by the name of Sophisms. There are two general classes of fallacies—Formal and Informal. The former violate the rules of Logic, and are therefore logical fallacies, which appear under five different forms, which were enumerated and explained in the foregoing chapter.

The Informal fallacies do not strictly belong to Logic, as they do not violate its rules and axioms, but occur in the subject-matter of the propositions with which Logic has nothing to do. The reason for noticing them is given in their presentation, as well as the different kinds recognized.

Verbal fallacies were treated in the same way in this chapter.

A few cautions in the way of examples were also given to illustrate *popular fallacies*.

PRACTICAL QUESTIONS.

1. What is a fallacy?
2. What is a sophism?
3. Give the general division of fallacies.
4. Name all the fallacies given.
5. Which are logical and which not?

CHAPTER IX.

PECULIAR MODES OF SYLLOGISMS.

There are three modes of using the Syllogism, called respectively, the Argument *à priori*, the Argument *à posteriori*, and the Argument *à fortiori*. We have already shown the use of the first two of these as applicable respectively to the *Deductive* and *Inductive* methods of reasoning, explained in Chapter V., and as they are said to be modes of the Syllogism, we will only add that they are appropriately applied to the Deductive and Inductive forms—the *à priori* to the deductive and the *à posteriori* to the inductive.

ARGUMENT A FORTIORI.

This we define to be an argument of a *stronger* form, and as the Syllogism is *the* ultimate form of the argument, it is the *stronger form Syllogism.*

It is also a peculiar form as well as the stronger form.

We submit the following to show its form:

A horse is stronger than a man.
An elephant is stronger than a horse.
A fortiori, An elephant is stronger than a man.

The *à fortiori* means here for a stronger reason, the elephant is stronger than a man, since the horse is stronger than man, and the elephant is stronger than the horse.

Julius Cæsar, who was a logician as well as an orator and warrior, used this powerful argument to recover his army from a panic brought on by a rumor that the Germans were fierce warriors of giantlike forms. His argument ran thus:

The Helvitians have conquered the Germans in many battles.
The Romans (you) have conquered the Helvitians.
For a stronger reason, the Romans can conquer the Germans.

This chapter being very short and simple, we will give no Syllabus nor practical questions, admonishing the student to make himself fully acquainted with what is said of these peculiar forms in both this and the fifth chapter.

We now close this chapter, and with it the elements of Logic as given first by Aristotle, and will devote the next to an exemplification of the Logic of Socrates, who in a philosophical relation is the grandfather of Aristotle.

CHAPTER X.

THE SOCRATIC METHOD OF REASONING.

This method, as its name indicates, had its origin with Socrates, the illustrious Greek philosopher, 400 B. C., and presents very forcibly one of the leading traits of his philosophic mind, to-wit, that of professing to *know* nothing himself, and constantly *asking* information of his antagonist until he had completely entangled him in his own web and network, when it would manifestly appear that all the information was on the side of the great Know-nothing, Socrates.

This argument, or mode of argument, is conducted by a series of questions and answers, in which the questioner is finally the victor in the dispute, provided he has the ingenuity to arrange the questions so as to make them both exhaustive and conclusive. This requires no ordinary skill, but the sharpest penetration of intellect and the most skillful use of language are necessary for its consummation; yet it amply repays all outlays, for the victory, when achieved, is complete, and silences all cavilings. In fact, it partakes largely of demonstration itself.

It is a fair method, and requires the parties to the controversy to be candid and sincere in the pursuit of truth. But, if the respondent should prove stubborn and evasive in his answers, or refuse to answer at all, he will inevitably fall by his own weapons. There is no escape for him except in the justice of his own cause, the want of it in his opponent's cause, or the weakness in its presentation.

The very nature of the method implies an honest difference of opinion, and victory will perch on the side of the right if properly handled.

EXAMPLES OF THE SOCRATIC METHOD.

Some years ago we prepared the following arguments to illustrate this method of reasoning to our Senior Class in college, and here present them for a similar purpose, with no disposition whatever to influence any one to adopt the conclusions reached:

Dialogue Between an Atheist and a Deist.

The course embraces three lectures, beginning with the Atheist as the character farthest removed from the spheres of belief in God and Revelation, and ending with the Infidel and Sceptic, who doubt and deny the divine origin of the Bible. The following lecture is No. 1 in the series, and is intended to bring out the point of difference between the Atheist and Deist. Hence these are the characters assumed:

Deist. Do you believe that there is a God?

Atheist. As the expression is generally understood, I confess I do not.

D. Do you admit your own existence and that of other things around you?

A. I certainly do.

D. What evidence have you of it?

A. My own consciousness, which is the highest order of evidence we have of anything.

D. Have you and the things about you *always* existed?

A. I readily admit that I have not, but cannot say as to the other things.

D. Then you admit that *something* now exists?

A. I most certainly do.

D. Since *something* now exists, *something* must always have existed, or else there was a time when nothing existed. Do you admit this?

A. I confess that is not only a logical, but a self-evident conclusion. It is axiomatic.

D. Remember that existence is the thing insisted upon, and

you must now take one or the other horn of the dilemma; you must either admit that the things now existing have existed always, and consequently are self-existent, or you must admit that they have not existed always, and consequently that they are not self-existent. Which horn will you take?

A. Yes, but we are finite beings, and cannot know whether they have existed always or not.

D. Whether you know it or not, whether you admit it or not, right reason says one or the other must be true. You will not deny the authority of reason?

A. I do not deny the authority of right reason. Sound human reason is the only guide we have. It is only the weak and silly that talk of faith and revelation. Reason alone is my guide.

D. Since you have appealed to reason, to reason we will go. Reason says that the things now existing have either existed always, or that they began to exist at some time past. One or the other is inevitable. Which horn of the dilemma will you take?

A. I confess that it seems that there is no course left me but to take one or the other horn of the dilemma, and I therefore give it as my belief that they have *not always existed.*

D. But I would remind you, my friend, of the fact that *faith or "belief"* constitutes no part of this argument, since you have renounced both and appealed to reason alone. To reason "we must go." Please be candid enough to say that all things *have* existed always or that they have *not.*

A. I confess that reason says they have *not* existed always, and reason is my guide.

D. Then they must have begun to exist at some past time?

A. I admit that.

D. Did they create themselves, or were they created by another?

A. It is unreasonable to say they created themselves, for

that would imply that they existed before they began to exist, which is not only false to reason, but absolutely absurd. They were therefore created by another.

D. Who, then, is this other that you say created the things now existing?

A. Reason teaches me that men and things are the result of *fixed laws*.

D. Granted, but did these laws *fix themselves*, or are they the creatures of another cause?

A. I regard everything as a result of fixed laws, and the laws themselves as eternal and unchangeable.

D. Please tell us what we are to understand by "*fixed laws*"?

A. "Fixed" means established, and laws are regular methods or modes of action or operation.

D. Very good. Then laws are nothing in themselves. According to your definition they are simply the modes of operation and methods by which certain phenomena follow certain causes. They have no force of themselves, but are only the manner of directing force. The cause is outside of the laws. The outside cause operates through these laws, as mere means. Is not this true?

A. I must admit that it is a just view of the matter.

D. Then there is a cause—a force outside of the "fixed laws" which operates through them, and controls them, and all things subject to them?

A. I cannot deny the conclusion. I was only mistaken as to where the force resides. I now surrender my theory, since the force is not inherent in fixed laws, which has been my pet theory. I see now it is impossible.

D. I understand you to admit now that these "fixed laws" did not fix them themselves, and that there is a force superior to them?

A. I do.

D. Then you must admit that this "superior force" is self-existent, or that some other, the cause of this, is so, since force cannot create itself any more than other things.

A. I am free to admit that what you say is reasonable.

D. That which is self-existent has always existed, else at some time it would have begun its own existence, which it could not do without having existed before it began to exist. Whatever exists of itself exists always and from all eternity, and it cannot cease to exist; its cause is within itself, and it exists by absolute necessity, because it cannot be otherwise than it is. For whatever can be otherwise is contingent, and is not necessary, but changeable. Therefore that which is self-existent is eternal and unchangeable.

A. I must admit your conclusions are just.

D. Then there is but one more question between us. Is this self-existent, eternal, and unchangeable force the cause and creator of all things?

A. I admit there can be but one infinite cause without a conflict of infinities; that this one is the cause of all finite things, that it must be the perfection of every *good* quality, hence the self-existent, eternal, unchangeable, Almighty God—the sum of all good.

DIALOGUE BETWEEN A DEIST AND A CHRISTIAN.

CHRISTIAN. Do you believe in the existence of God?

DEIST. I do.

C. Do you believe he is self-existent and eternal, and the Creator of all things?

D. I do. He is the cause in himself of his own existence, and hence exists from absolute necessity; otherwise he would be contingent, and consequently changeable, for whatever does not exist of necessity is contingent, and is liable to change. I believe, also, that he is the Creator of all original

things, and is their prime cause—"the Great First Cause least understood."

C. Very good. Do you believe that God has made a written revelation of his will to man?

D. I *do not.* I believe the Bible to be a "cunningly devised fable," interesting in some respects, but very inconsistent with itself in others.

C. Do you admit that the great principles taught in the Bible accord with right reason and sound morality?

D. That they may do; I neither affirm nor deny. But admitting they do, it would not necessarily follow that they are from God, since men have taught many sound principles who knew nothing of the Bible, of which Socrates was an illustrious example.

C. You admit that such a man as Socrates has lived then, I presume?

D. I do, most freely, and I admire his teachings.

C. Enough of Socrates for the present; we may refer to him after a little. I presume you have read the decalogue delivered by Moses?

D. I have read Moses' Code, or the Ten Commandments.

C. Do you admit that they teach sound morality, and accord with right reason?

D. I do. But the same may be said of the Codes of Solon, Lycurgus, and Confucius.

C. I presume, then, that you believe that Solon, Lycurgus, and Confucius all once lived in the world, and that each has a code of laws now extant in the world?

D. I certainly do, and think that the world has been benefitted by their having lived in it.

C. Please be kind enough to state, now, upon what evidence you believe that they once lived in ages past, and were the authors of the codes bearing their respective names. Also state the same in reference to Socrates.

D. We have the codes themselves as witnesses, and besides, there is the undoubted testimony of history concerning their writings, all brought down through the ages to us, without the least pretense of enthusiasm or miracles.

C. But may it not be possible that these ancient codes and writings were the work of other men, and by mere fiction assigned to those whose names they bear?

D. This would be impossible, since we find that they were all good men, and good men would not seek to impose upon their fellowmen in claiming the authorship of works not their own. Besides this, we have the testimony of contemporaneous witnesses to the fact that they were the authors of them, and that they were men incapable of an effort to impose upon and deceive their fellowmen. In addition to all this, they have been referred to as such authors from the very days when their works were written to the present, without a single denial, or even a question as to the genuineness of their authorship. There can be no mistake about the matter. The world has accepted them as the duly accredited authors for thousands of years, and it now, according to all rules of logic and equity, rests upon the disbeliever to *prove* that they were impostors. Established facts throw the burden of proof upon those who doubt them.

C. I admit the correctness of your logic, and the inevitable conclusions to which your premises must lead every candid enquirer after truth, and all I ask of you now is to admit the same reasoning and conclusions when applied to *another* set of authors quite as prominent before the world as Solon, Lycurgus and Confucius. I am glad to find that you have such unshaken confidence in the testimony of history, for the Bible has a history the most wonderful the world ever knew, and it is itself a history without an equal in the annals of time. And in order that we may fully understand each other, and avoid a war of words, let us recapitulate the points of evidence in

your testimony of history. They are these: 1. The doctrines of Socrates and others are still extant, and must severally have had an author. 2. They accord with right reason and sound morality. 3. They show that their authors must have been good men. 4. Good men will not seek to impose upon their fellow-men works not their own. 5. Contemporaneous authors and witnesses testify to their genuineness. 6. These writings were accepted and believed by the communities in which they were first published at the very time of their publication. 7. They have been referred to ever since, and quoted from by other writers, as the productions of the men whose names they bear, and have thus been often tried and never denied. 8. And since their authenticity is now established, the burden of proof must rest upon those who doubt or deny them. Do you accept this as an exhaustive analysis of the testimony of history upon which you accept Socrates, Solon, Lycurgus, and Confucius as the authors of the works ascribed to them?

D. I do.

C. Then I propose to apply your own arguments to Moses and the prophets, to Christ and the apostles, who are the authors of writings quite as well known to the world as any you have named. Are you willing to accept the force of your own logic?

D. To be candid, I confess that I cannot well object to the use you make of my argument, but I did not expect you to take such a turn as that. I presumed that you would rely mainly upon "miracles and prophecies," as you would term them, the existence of which I do not admit.

C. Very good. We will talk about the "miracles and prophecies" after a while. "The undoubted testimony of history" is what I rely upon at present, and I am glad to know that we agree so well as to the validity of testimony by

which our difference is to be settled. And now for the application of your argument. 1. The writings and doctrines of Moses and the prophets, of Christ and the apostles, are now extant in the world, and have been for thousands of years, and there is no other accredited account of their authorship, except that which they claim for themselves. The world, for nearly two thousand years, has been unable, by all its wisdom, to prove any other account of their origin; and since their claim to authorship is now well established, "the burden of proof rests upon those who doubt." 2. These writings and doctrines accord with right reason and sound morality. Nothing is more reasonable than that God, having created the world, and all things therein, as you yourself admit, would reveal to man his origin, purpose, and destiny; and no system of morality ever taught is comparable with that of the Bible. 3. Hence, they show that their authors must have been good men; for bad men would not write such a book as the Bible if they could, since it condemns them on every page. 4. Good men would not have sought to impose upon the world works which were not their own. 5. Contemporaneous witnesses and authors testify both to the character of these authors and the genuineness of their productions. 6. These writings and doctrines were accepted and believed by the communities in which they were first published, and at the very time of their publication, and thousands of persons became converts to their teachings, some of whom laid down their lives rather than deny or recant them; and many others, while rejecting the doctrines, bore indisputable testimony *that these very men* were the authors of those doctrines to the extent of beheading and executing them for the very reason that they had promulgated such doctrines. 7. These writings and doctrines have been referred to ever since their publication, by both friends and enemies, and quoted

from by other writers as the productions of the men whose names they bear; all of which goes to show, conclusively, that the writings in question are genuine. 8. Having been thus established, and so accepted by the world generally, the burden of proof now rests upon those who doubt and disbelieve them. Now, in all candor, I ask you if my authors do not come up as fully to the requirements of the eight points in the "undoubted testimony of history" as yours do; and if so, are not Moses and the prophets, Christ and the apostles, entitled to as much credit as Socrates and Solon, Lycurgus and Confucius?

D. I must confess that they do, and that the one set of authors is as much entitled to credit as the other; and while I am compelled to admit that your authors are what they claim to be, yet I cannot believe what they say. For instance, I cannot believe the story of "miracles and prophecies."

C. My dear sir, you must remember that we have agreed to be candid, and that one of the eight points admitted by you is, "that good men are incapable" of imposing upon their fellow-men, and you have admitted this point as applicable to my authors.

D. I know I have, but as they were *men* they might have been mistaken about the matter.

C. It is true they were *men*, but they say they *saw* the miracles, and some of them were subjects of them; and men cannot be adjudged as mistaken about what they clearly see and feel; they were conscious of the facts, and consciousness is the highest order of human testimony. Besides this, the Bible gives us a history of human affairs and civil governments, as well as of miracles and prophecies. You accept the former as authentic; you cannot reject the latter, for we have the same historical evidence for the one as the other. The Bible testifies to both; you cannot take part of a witness'

testimony and reject the other. You must take it all or reject it all. Which will you do?

D. Candor compels me to accept it *all*. I therefore admit that I may have been mistaken, and that the Bible may be true. I will seriously reconsider the whole matter.

C. I hope you will; and I feel confident that if you try as hard to *believe* it as you have to *disbelieve* it, you will find that the easiest and most rational view of the Scriptures is to accept them as *true*.

DIALOGUE BETWEEN A DEIST AND A CHRISTIAN.

NO. 3.

DEIST. I have considered the subject of our last interview, and although I admitted to you that the Bible might be true, I have some serious objections to offer against it as a revelation from God.

CHRISTIAN. I would be pleased to hear and try to remove any reasonable objections that may exist.

D. Revelation means making clear to view, and that is the very thing the Bible does not do. It is the most *mysterious* book in existence.

C. I presume you will admit that the works of creation and the laws of nature are a revelation from God?

D. I certainly do; but man's eternal salvation does not depend on his understanding and obeying them.

C. What is your reason for thinking it does not?

D. Well, I don't know that I have any particular reason, but I feel confident that it does not, and you Bible-men do not believe it.

C. It does not matter what we "Bible-men" believe or teach; you do not accept our teachings, and hence cannot use us as testimony.

D. It is contrary to reason to think of man's eternal salvation being dependent upon physical laws.

C. That is only your assertion without stating how it contravenes reason. Now, suppose you subtract from your belief on that subject all that you have unconsciously gathered from the Bible in regard to man's eternal salvation, and then state distinctly your *reason* for believing man's eternal salvation does not depend upon physical laws.

D. Man is a spiritual being, and spirits are not governed by physical laws.

C. Where did you learn the *fact* that man is a spiritual being?

D. I think that proposition is generally admitted.

C. I acknowledge that it is; but upon what authority is it admitted?

D. Well, it is taught by philosophers and school-men of all ages, both ancient and modern; and their teachings on this subject, as well as on many others, have never been successfully controverted.

C. I admit all this, and will throw into the bargain ancient and modern logicians, and will now ask you to state the premises or the syllogism by which they prove that man is a spiritual being.

D. I confess that I do not know upon what premises they teach it, but it is a well-known fact that all nations and ages have believed it more or less. Even the American Indians in a savage state talk of spirits, and the "Great Spirit," and bury their dead with all their hunting accoutrements, that they may have them in the spiritual word.

C. I admit the truth of this, your last statement, throughout: First, that you do not know upon what authority it is taught, neither do I, nor they who teach it, unless they derive it, directly or indirectly, from the Bible. Second, that all nations and ages have believed it more or less, even the savages of America, and I insist that they have all received

the idea, directly or indirectly, from the Bible. But this is a point aside from our main issue. Let us bring it to a close. You hold that the idea that man is a spiritual being is in the world independent of the Bible, and I deny it. Now for your proof.

D. I confess I have none, except what I have given, and candor requires me to admit that is not sufficient.

C. You have given all that can be given, and it amounts to nothing. Without the Bible man knows not *whence he came, what he is, nor whither he tends.* Now, I presume you will admit that the Bible teaches the doctrine of man's spirituality, whether you believe it is from God or not?

D. I admit that it does.

C. Well, now let us return to the previous question: Are the works and laws of nature a revelation from God?

D. They are; and the only revelation he has given of himself to man that is without serious objections. If the Bible be a revelation, it is full of mysteries and contradictions.

C. Very well. I now propose to show you that your boasted revelation—the works of nature—is as full of mysteries and contradictions as the Bible, and even more so. And we will first consider the "mysteries." Are there not many mysteries in the works of creation which you cannot comprehend? For instance, why are there chemical affinities between some substances and not between others? What is the cause of the attraction of gravitation? What is the physical constitution of the sun? Whence come its heat and light? Please explain any one of these upon known principles.

D. I admit at once that I cannot do it.

C. Then we find as great mysteries in *your* revelation as in mine, and even greater. And now for the contradictions.

Please tell me what is more contradictory than the law that "heat expands and cold contracts," and yet that water both contracts and expands by freezing?

D. I admit that is one of the paradoxes of nature which cannot be explained at present.

C. Why is it that the brain is the seat of sensation, and *it is itself* insensible?

D. That is another seeming paradox which cannot be explained, and I am candid to admit that there are many such in nature.

C. Then I hope you will admit without further argument that your natural revelation is as full of mysteries and contradictions as mine?

D. I feel bound to do so, as your arguments are unanswerable.

C. Then, since your revelation is seemingly full of mysteries and contradictions, and yet you claim that it is from God, why not admit mine on the same parity of reasoning?

D. Men could have been the authors of the Bible but not creation.

C. Yes, but you remember that we settled the point of authorship in our former interview, on the principle that none but good men are its authors, and if good men are its authors, what they say is true. They say it came from God, therefore it must be true. We are now discussing the objections you have offered to the Bible itself, and not its authorship. Please be candid, and state whether there are greater mysteries and contradictions in the Bible than in the book of nature, or whether they are both alike incomprehensible to finite minds in some parts, yet sufficiently comprehensible, if studied, to be of the greatest pleasure and utility to man.

D. I confess that there are objections to both as regards mysteries and apparent contradictions, and that enough of

both may be understood to secure man's present and future interest. I now yield the point of dispute, and confess that deism is rather an excuse for neglect of written revelation than a reality. And this discussion has satisfied me that men object to many things which their finite minds cannot comprehend; yet the things objected against remain true nevertheless; and that if they would be honest with themselves, and make the same efforts to remove the objections that they do to establish them, they would find it easier to *believe* than *disbelieve* the things objected to.

C. Besides all this, the Bible has the following points of internal evidence which challenge refutation: 1. It speaks as no man can speak. 2. It is the only rational account of man's origin and destiny extant. 3. It is a history of events so marvelous, yet so true to the attributes of God and the nature of man, that none but an infinite mind could have indited it. 4. It is reasonable that God, having created man with a moral nature, should give him a law to govern it, and as the Bible is the only book extant which has the necessary requisites for such a law, and as it would be unreasonable for a superior intelligence to create an inferior intelligence without some revelation to the latter as to the purposes of its creation, we readily conclude that the Bible is the revealed will of God to man, and will close the argument with the following Syllogism:

If any plan could be devised by which the Bible could be shown to have been produced by human agency alone, it would have been done before now: but no such plan has ever been devised: therefore none can be so devised. An infinite God finitely comprehended is no God at all.

EXAMPLES.

The following examples are given to test the student's knowledge of the various forms of arguments and fallacies which have now been presented to him in this little book. He should now be able to put each example in its proper form, name it, and show whether it is a valid, or invalid argument. Thus, e. g. :

1. Ought we to act from expediency as a motive?

Let us syllogize it.

> We should always act from right as a motive.
> Expediency is sometimes right.
> Therefore we may sometimes act from expediency as a motive.

2. Should children obey their parents?

> Children should do whatever is right.
> It is right to obey our parents in some things.
> Therefore children should obey their parents in some things.

3. Jesus wept.

4. No evil should be done that good may result; all punishment is an evil; therefore no punishment should be allowed.

5. Every one desires happiness; therefore every one desires virtue.

6. No one is good who commits sin; all men commit sin; therefore there is none good except God.

7. A designing man is not worthy of trust; therefore engravers are not worthy of trust.

8. Every American citizen should be free; I am an Amer-

ican citizen; therefore I should be allowed to do as I please.

9. All that glitters is not gold; tinsel glitters; therefore tinsel is not gold.

10. Happiness consists in obedience to the Divine laws; this obedience is virtuous conduct; virtuous conduct is the subordination of the inferior to the superior in our nature; this is secured by self-control; therefore happiness is the result of self-control.

11. We must do one of three things: Go back, stand still, or go forward in life. Formulate this so as to show which we must do.

12. Cotton will either fall, remain as it is, or rise in the next ten days. Which?

13. Mr. Hurst said to Mr. Davids: "A man must either work, steal, or starve. You neither work, nor starve." "Sir, do you mean to insult me?" inquired Mr. Davids, excitedly. "No, sir; I only meant for you to draw your own conclusion from this dilemma," replied Mr. Hurst. What was that conclusion?

14. What is the matter with this? From evil doers springs the making of good laws; from good laws arises the safety of society; from the safety of society all social good things flow. Therefore, from evil doers flow all good things to society.

15. If men are to be punished hereafter God must be the punisher; if God be the punisher, the punishment must be just; if the punishment is just the punished must be guilty; if they are gulity they could have acted otherwise; if they could have acted otherwise they were free agents. Therefore, if men are liable to punishment in another world, they must be free agents.

16. In this life we must either obey our vicious inclinations or resist them; if we obey them we shall have sin and sorrow; if we resist them we shall have pain and labor; but we must

either obey or resist them. Therefore we cannot be free from trouble in this life.

17. All persecution for conscience's sake is displeasing to God, because it is injustice. All religious persecutions are for conscience's sake, because they assume to dictate to conscience. Therefore all religious persecution is displeasing to God. Give name to this and see if it is correct.

18. No man can do these miracles which thou doest except God be with him. Therefore we know thou art a teacher sent from God.—*Nicodemus.*

Put this into the Syllogistic form.

19. No man can serve two masters. Ye cannot serve God and mammon. Put this into the simple Syllogistic form, and then into the compound hypothetical dilemma.

20. Epimenides the Cretan says that "all the Cretans are liars;" but Epimenides himself is a Cretan; therefore he himself is a liar. But if he be a liar, what he says is untrue, and consequently the Cretans are truthful. But Epimenides is a Cretan, and therefore what he says is true. And he says the Cretans are all liars.

21. Since it is false that all men are liars, its contrary must be true, that no men are liars.

22. Alexander was the son of Phillip, and by immediate inference, *i. e.*, without a middle term, we can infer that Phillip was the father of Alexander.

23. No cat has two tails. Any cat has one tail more than no cat; therefore any cat has three tails.

24. Eight hats cost $48. One hat will cost one-eighth of $48. Therefore one hat costs six dollars.

PARLIAMENTARY RULES.

Believing that a school should be a preparatory stage for after life, we hold that it should be conducted by the same rules which govern men in deliberative bodies, that is by

Parliamentary law. This is the most natural method, since the school already has a presiding officer, and is divided into classes, or *committees*, with the head man as chairman. The recitation is simply the report of the committee, which each member is required to explain and discuss. And if this be done according to these rules, the students will feel quite at home after they leave school and enter the deliberative bodies in which the business and duties of citizenship are discharged. Entertaining this view of the subject, we subjoin the following brief summary of parliamentary rules:

APPENDIX.

PARLIAMENTARY LAWS.

Every deliberative body should have a president, vice-president, secretary and treasurer, whose duties are prescribed in the written constitution.

1. The president shall preserve order, and conduct all business before the body to a speedy and proper result.

2. He shall rule the deliberations according to Parliamentary laws.

3. He shall arise and present every subject to the body for deliberation.

4. He shall appoint all committees not otherwise provided for.

5. The president shall give the casting vote in cases of a tie, and vote last when the yeas and nays are called for and recorded.

ORDER OF BUSINESS.

1. Reading, correcting and approving the minutes.
2. Communications received and disposed of.
3. Reports of Standing committees.
4. Reports of Select committees.
5. Resolutions.

Papers under each of these heads may be taken up when presented, by unanimous consent, but if any objection be offered, they must be entered on the docket.

THE DOCKET.

When the unfinished business and special orders have been disposed of, the business on the docket shall be taken up in the order in which it is docketed. Motions to elect officers, appoint committees, and enroll members are, however, always in order.

MOTIONS.

All motions must have a second, and be re-stated by the president, before it is debatable; but this does not prevent the mover from explaining his motion. Every motion should be reduced to writing, if requested by a member.

The mover is entitled to the floor first in the discussion, if he desire it.

Every member must rise to his feet before addressing the chair, or offering a motion, or resolution.

Any motion may be withdrawn by the mover with the consent of the second before any debate is had; otherwise it cannot be done without the unanimous consent of the body.

A motion to postpone to a day certain, to commit, or to postpone, being decided in the negative, shall not again be allowable on the same day.

A motion to refer to a standing committee takes precedence over one to refer to a select committee.

A motion to take up any item of business being negative, shall not be renewed before the intervention of other business.

A motion to adjourn to a day certain is debatable, and may be amended as to time.

UNFINISHED BUSINESS.

The next item is the unfinished business in which the body was engaged at the last preceding adjournment, which takes preference over orders of the day, but may be, on motion,

postponed in order to take up special orders of the day.

No motion can be entertained while a member has the floor, or while a vote is being taken.

A motion to adjourn being negatived shall not be renewed until some other business shall have been transacted.

A motion being tabled, disposes of the matter during the pleasure of the body. It can be called up whenever the body so decides.

A motion being indefinitely postponed cannot be renewed during the session, except by reconsidering the vote.

Any motion under debate, and being susceptible of division into parts, may be divided on the request of any one member, and the vote taken on each part separately.

When a motion to close debate prevails, it stops all discussion on the main and all collateral questions.

The secretary must read any motion or paper before the body whenever the reading is called for by a member, and if a second reading be objected to, the call for it may then assume the form of a privileged motion, and be decided by vote as any other motion.

A member may appeal from the decision of the president to the body, which shall be decided without debate.

Motions should be repealed by the same vote that adopted them: but it requires a unanimous vote of those present to expunge anything from the minutes.

LIMITATIONS OF DEBATE.

Motions to table, to docket, to take up business, to adjourn, to close debate, and the call for the question shall be put without debate. Members shall not speak more than once on any question until all have spoken who are desirous of speaking, and not more than twice without permission from the presiding officer.

PRIVILEGED QUESTIONS.

When a motion is being considered, no motion is in order, except to adjourn, to docket, to lay on the table, to amend, to postpone to a time certain, to postpone indefinitely, or commit; and these only in the order of precedence here given.

The motion to adjourn is always in order, except when a member has the floor, or while a vote is being taken.

When "the question is called," it shall be put in the usual way, without debate.

AMENDMENTS.

Any motion may be amended twice and only twice, and the vote on the amendments shall be taken before that on the original motion.

One motion may become the substitute for another, provided it cover all the matter in the original.

Any question can be reconsidered, provided a member who voted in the affirmative makes the motion, and it requires the same vote that adopted it.

In all cases of question the president shall decide which speaker is entitled to the floor. No speaker shall be interrupted, except to call him to order, correct mistakes and misrepresentations. The speaker must address the presiding officer with respect, and treat him and all members in the same manner.

VOTING.

Each member is required to vote, unless he shall have been excused by the body.

In filling blanks the vote shall always be taken on the longest time, and largest number first.

The yeas and nays may be recorded when required by one-fifth of the members present.

When the report of a committee has been received, it is competent to concur, non-concur, adopt, refer, recommit with or without instructions, or to amend.

The points not herein covered can be determined by reference to Jefferson's or Cushing's Manual of Parliamentary Laws.

FINIS.

OPINIONS OF THE WORK.

Those, to whom this work is submitted for examination, are requested to record here briefly their candid opinions of the merits of the foregoing treatise on Logic.

From Col. ED. W. MUNFORD, a scholar and lawyer of prominence :

I have no hesitation in commending the work on Logic by Prof. Burney. Its plan is original and gives to the students a much clearer conception of the principles of Logic and their practical application in the processes of reasoning than any work on the subject with which I am acquainted. I think it should by all means be printed and introduced into the schools of the country generally.

ED. W. MUNFORD.

From Col. C. C. CLEMENT, a distinguished editor and scholar :

PROF. BURNEY—It gives me pleasure to be able to say of the work on Logic, which I took occasion carefully to review, that I consider it one of the best compendiums upon that subject with which I am acqainted ; and for brevity, conciseness, adaptability and the general need, meets a desideratum long felt in the schools of high grade all over the land.

C. C. CLEMENT.

McMinnville, March 2d, 1881.

From Dr. T. C. BLAKE, author of a number of works on Theology, and late Professor of Mathematics in Cumberland University :

I have carefully examined the manuscript copy of Prof. A. M. Burney's treatise on Logic, and, without hesitation, pronounce it the best compend on the subject that I have ever seen. It should, by all means, be published, and be made a text-book in all of our schools. There is no work extant, within my knowledge, so well calculated to impart a correct knowledge of this important science. So clear and lucid are his definitions, and so simple, yet so comprehensive are his methods of inculcating the correct mode of reasoning that the work can not fail to interest both teacher and pupil. Indeed, with such a text-book, the science of Logic, which has heretofore been regarded as one of the most barren and unprofitable, not to say *incomprehensible*, can not fail to be studied, not only with profound interest, but with great profit.

T. C. BLAKE.

Nashville, Tenn., March 29, 1881.

From R. A. CLARK, Professor of Mathemathics, Winchester Normal:

I regard the work on Logic, by Prof. A. M. Burney, now in manuscript, well worthy of publication. I would be glad to see it in print.

R. A. CLARK.

Winchester, Tenn., Sept. 14, 1881.

From ex-Gov. MARKS, a distinguished jurist:

The "little book" of Prof. A. M. Burney, upon Logic, if published, will supply a long felt want. In a brief compass he develops all that is worth knowing upon the subject he treats in a clear and simple manner.

ALBERT S. MARKS.

From R. V. FOSTER, Professor of Hebrew and Biblical Literature in Cumberland University:

It is a first-rate work, and well adapted to give the learner a good idea of the "Art of Reasoning."

R. V. FOSTER.

From Dr. S. G. BURNEY, Senior Professor in the Theological School of Cumberland University:

Having examined this text-book on Elementary Logic, by A. M. Burney, I heartily concur with others as to its high merit, and recommend its publication; also its adoption as a text-book in schools of all classes.

S. G. BURNEY.

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